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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/603,939	06/27/2000	David L. Graumann	81674-265759	4441

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EXAMINER

MICHALSKI, JUSTIN I

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/603,939	GRAUMANN, DAVID L.	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 30-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 30-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 30-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Best et al. "Best" (US Patent 4,876,617).

Regarding Claim 30, Best discloses a method to generate an output audio signal, comprising: removing a range of frequencies in an audio signal to produce a notched audio signal (Fig. 1); generating a masking signal that falls in one portion of the range of frequencies (10 and 11); generating a data signal that falls in the range of frequencies and apart from the one portion (output of 15 and 16); and combining the notched audio signal, the masking signal, and the data signal for form the output audio signal (Audio O/P).

Regarding Claim 31, Best further discloses transmitting the output audio signal (Audio O/P).

Regarding Claim 22, Best further discloses the masking signal falls within a critical band of the data signals (bands of notch filters).

Regarding Claim 34, Best further discloses a method of processing a combined audio signal, comprising: receiving the combined audio signal including a masking signal residing in a frequency range (Fig. 4, Audio I/P), a data signal residing in the frequency range, and audio information residing outside the frequency range; separating the masking signal and the data signal in the frequency range from the audio information outside the frequency range; and filtering the data signal in the frequency range from the masking signal (Figs. 4-6).

Regarding Claim 35, Best further discloses the masking signal resides in the first portion of the frequency range (1KHz to 6KHz) that is distinct from a second portion of the frequency range in which the data signal resides (bands at 2883Hz and 3417Hz).

Regarding Claim 36, Best further discloses decoding or demodulating the data signal after the filtering to extract data from the data signal (Fig. 4).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4, 5, 9, 10, 12, 13, 16, and 17, are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer et al. (US Patent 6,584,138) in view of Best et al. (US Patent 4,876,617).

Regarding Claims 1 and 9, Neubauer discloses a method and apparatus for generating an enhanced acoustic transmission signal (Fig. 1), the method and system comprising: generating a carrier signal ($\cos \omega_T t$); receiving data and generating a data signal representing the data (104); modulating the carrier signal with the data signal to form a modulated carrier signal at a carrier frequency (modulator 110); generating a masking signal to mask the modulated carrier signal from being audible by a human ear (106); receiving audio and generating an audio signal based on the audio (Input to 100); and combining the modulated carrier signal, the masking signal, and the audio signal to form the enhanced acoustic transmission signal (112). Neubauer does not disclose removing a frequency bands surrounding the carrier frequency from the audio signal. Best discloses a notch filter to remove a portion of an audio signal and insert data (Fig. 1, notch filters). Best discloses the notch filters facilitate incrtion of data at frequencies to ensure that no music breaks through into the decoding circuits (Col. 2, lines 17-31). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to remove a frequency band around a carrier signal in order to insert coded data in a way to ensure that no music breaks through into the decoding circuits.

Regarding Claims 2 and 10, Neubauer discloses the carrier signal is a sine wave ($\cos \omega_T t$).

Regarding Claims 4 and 12, Neubauer discloses the masking signal is narrowband random noise (Col 10, lines 61-64).

Regarding Claims 5 and 13, Neubauer discloses the modulated carrier signal is at a level that is detectable by a decoding system while still being masked by the masking signal (Col. 1, lines 59-64).

Regarding Claim 16, Neubauer further discloses the modulated carrier signal and the masking signal are first combined to form a masked encoded signal (Fig. 1, output of 110), then the audio signal is combined with the masked encoded signal to form the enhanced acoustic transmission signal (112).

Regarding Claim 17, Neubauer further discloses the modulated carrier signal, the masking signal, and the audio signals are combined simultaneously to form the enhanced acoustic transmission signal (112).

6. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer/Best as applied to claims 1 and 15 above in view of Boney et al. ("Boney") (1996 IEEE International Conference on Multimedia Computing and Systems, Jun. 17-23, Hiroshima, Japan; Laurence Boney et al.; "Digital Watermarks for Audio Signals", pp 473-480.).

Neubauer discloses a method and system as stated apropos of claims 1 and 15 above but does not disclose the masking signal has a bandwidth less than one critical band of the modulated carrier signal. Boney also discloses inband coding of data in an

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audio signal and teaches that the critical bands are defined around a center frequency in which the noise bandwidth is increased until there is just noticeable difference in the tone at the center frequency. Thus if a faint tone lies in the critical band of a louder tone, the faint tone will not be perceptible (pg. 475, Col.1, first paragraph under heading 2.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a masking signal bandwidth less than one critical band of the carrier signal in order to prevent the masking signal from being perceptible as taught by Boney.

7. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer/Best as applied to claim 9 above in view of Boney et al. ("Boney") (1996 IEEE International Conference on Multimedia Computing and Systems, Jun. 17-23, Hiroshima, Japan; Laurence Boney et al.; "Digital Watermarks for Audio Signals", pp 473-480.). Neubauer discloses a method and system as stated apropos of claims 9 and 18 above including a microphone to receive audio (Fig. 4, microphone 400) and a data input device (Fig. 1, 104). Neubauer does not disclose the system is a telephone system. Boney also discloses inband coding of data in an audio signal and telephone speech signals from 50-7000 Hz. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system as disclosed by Neubauer over a telephone system to transmit audio and data signals over a distance.

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8. Claims 3, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer/Best as applied to claims 2 and 10 above in view of Bassani et al. ("Bassani") (US Patent 4,035,838). Neubauer discloses a system and method as stated apropos of claim 2 and 10 but does not disclose the carrier signal being a pulsed wave. It is well known in the art that variety of modulation techniques can be used to modulate signals including pulse-modulation. Bassani discloses pulse modulation to transmit data over a carrier wave (Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pulse modulation to transmit data over a signal.

9. Claims 7, 8, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer.

Regarding Claims 7 and 18, Neubauer a method and system of decoding an enhanced acoustic transmission signal including a modulated carrier signal formed by modulating a carrier signal at a carrier frequency with a data signal representing data, a masking signal adapted to mask the modulated carrier signal from being audible by a human ear, and an audio signal modified so that a frequency band surrounding the carrier frequency is removed from the audio signal, the method and system comprising: receiving the enhanced acoustic transmission signal (Fig. 4, 400); filtering the enhanced acoustic transmission signal to isolate the modulated carrier signal from the masking signal and the audio signal of the enhanced acoustic transmission signal (filter 402, Col. 13, lines 5-11); demodulating the modulated carrier signal to extract the data signal from

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the modulated carrier signal (Although Neubauer does not explicitly disclose demodulation of the carrier signal, Neubauer discloses the data modulated on the signal to be decoded, col. 13, lines 9-11. Neubauer further discloses the signal to be decoded passing through blocks 404, 406, 408, 410, and decoder 412 to produce the decoded signal. It is inherent that demodulation will take place in order to take the data modulated a signal and produce a pure data signal that is output from decoder 412); and decoding the data signal to extract the data (412). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a demodulator could be used to demodulate a data signal modulated on a carrier in order to decode and output a pure data signal as taught by Neubauer.

Regarding Claims 8 and 19, Neubauer further discloses the modulated carrier signal is isolated from the masking signal by using a finite impulse filter (FIR filter 408).

10. Claims 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer as applied to claims 18 above in view of Boney et al. ("Boney") (1996 IEEE International Conference on Multimedia Computing and Systems, Jun. 17-23, Hiroshima, Japan; Laurence Boney et al.; "Digital Watermarks for Audio Signals", pp 473-480.). Neubauer discloses a method and system as stated apropos of claims 9 and 18 above including a microphone to receive audio (Fig. 4, microphone 400) and a data input device (Fig. 1, 104). Neubauer does not disclose the system is a telephone system. Boney also discloses inband coding of data in an audio signal and telephone speech signals from 50-7000 Hz. Therefore it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to use the system as disclosed by Neubauer over a telephone system to transmit audio and data signals over a distance.

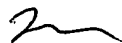
Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (571)272-7524. The examiner can normally be reached on M-F 7-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM


November 21, 2005


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